

PATENT COOPERATION TREATY

REC'D 11 AUG 2005

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From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:
SEAN C. MYERS-PAYNE
CALFEE, HALTER & GRISWOLD LLP
1100 FIFTH THIRD CENTER, 21 EAST STATE STREET
COLUMBUS, OH 43215

Date of mailing
(day/month/year) **09 AUG 2005**

Applicant's or agent's file reference

22727/04309

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US05/09238

International filing date (day/month/year)

21 March 2005 (21.03.2005)

Priority date (day/month/year)

22 March 2004 (22.03.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): C12N 15/86, 15/85, 15/87 and US Cl.: 435/455, 456

Applicant

THE OHIO STATE UNIVERSITY RESEARCH FOUNDATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US

Mail Stop PCT, Attn: ISA/US
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P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (703) 305-3230

Authorized officer

Konstantina Katcheves

Telephone No. (703) 305-3388

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US05/09238

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/09238

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 1-15 YES

Claims NONE NO

Inventive step (IS)

Claims 1-15 YES

Claims NONE NO

Industrial applicability (IA)

Claims 1-15 YES

Claims NONE NO

2. Citations and explanations:

Claims 1-15 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the method of the claimed invention.

The invention of the instant claim is drawn to a method comprising transfecting a packaging cell with a retroviral expression vector, culturing the transfected packaging cell line, culturing mammalian natural killer cells in the medium with the packaging cell line. The packaging cell line is a phoenix cell line, the expression vector is PINCO, the natural killer cells include CD56^{bright} and CD56^{dim}.

Liberatore et al. teach a method of transfecting natural killer cells. The Liberatore et al. method use phoenix and PA317 packaging cell lines. Liberatore et al., however, fail to teach that the natural killer cells are grown in the same medium with the packaging cell line.

Notal et al. and Cheng et al. generally teach phoenix packaging cell lines, not a method of transfecting natural killer cells.

Claims 1-15 the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

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International application No.
PCT/US05/09238

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-15</u>	YES
	Claims <u>NONE</u>	NO
Inventive step (IS)	Claims <u>1-15</u>	YES
	Claims <u>NONE</u>	NO
Industrial applicability (IA)	Claims <u>1-15</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1-15 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the method of the claimed invention.

The invention of the instant claim is drawn to a method comprising transfecting a packaging cell with a retroviral expression vector, culturing the transfected packaging cell line, culturing mammalian natural killer cells in the medium with the packaging cell line. The packaging cell line is a phoenix cell line, the expression vector is PINCO, the natural killer cells include CD56^{bright} and CD56^{dim}.

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